THE EFFECT OF THE PROCESSING AID ON THE COLOURANT MASTERBATCH

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Introduction
Processing aid is used to improve the processability and handling of the pigments mixed together with high molecular weight polymers.

Colourant masterbatch with processing aid products are used to:
- Reduce the gel formation
- Minimize energy consumption and improve output
- Reduce die drool
- Improved the processability of the recycled material
- Improve the surface finish of the product
- Improve the dispersion of the high loaded pigments formulation.

Processing aid can be used on the colorant masterbatch based on LLDPE, LDPE, HDPE, PP, PS and other. They find in a wide range of the variety of application like blow moulding, injection moulding, extrusion, tubing and cabling process.

Processing
Processing aid is formulated to form a microscopic dispensed phase within the pigments and the polymer carrier. During processing the applied shear field cause the processing aid to phase separate from the pigments and polymer carrier and migrate to the die wall gradually forming a continuous layer.
Once the coating is complete, the back pressure of the extruder decrease to the minimum as the differential between the surface energies of the polymer and the coating allow for reduced friction during extrusion. Other additives in the system such as pigments and anti-oxidants as well as process conditions affect the coating and removal rates.

**Colorant processing aid masterbatch are manufactured to offer you:**

- Reduce change over time
- Eliminate die build up
- Eliminate gels and optical defects
- Increase the output up to 10%- 15%
- Eliminate sharkskin effects

**Advantages**

**Reduced Die drool and Gel formation**

During processing deposits of low molecular weight polymer, pigments and degradation products can build up on the die and extruder surface. A processing aid is able to reduce die build up because as the coating layer develops any degraded material clinging to the die is displaced and also stagnation in the extrusion process is minimized thus reducing the production of the thermal degradation products.

![Image 1*](image.png)

**Image 1**: Showing the extruder die exit with polymer melts: a) Without process aid, *increased* die build up. B) process aid, *reduced* die build up.

The addition of the processing aid on the colourant masterbatch results in good product produced at higher output rates.
Process Efficiency Improvements

The use of the processing aid reduces resistance between the mixture of the pigments and polymer melts and the die, resulting in die pressure and the motor torque to fall. Process temperature and output are kept constant processing aids can reduce motor energy consumption, while if process temperature and extrusion pressure are kept constant higher outputs can be achieved.

Processing aids reducing the die build up the extruder does not need to be stopped as frequently during production to clean such deposits, thus limiting down time. Industrial also found reduction in time for colour changes to be completed.